

of retinopathy of prematurity mandates a screening program by an interested ophthalmologist in every neonatal unit that cares for premature infants. Because the most important factor determining whether ROP will develop is birth weight, a birth weight criterion rather than an oxygen criterion appears logical, and many institutions screen all infants with birth weights of less than 1,500 grams. Because infants are highly unlikely to reach the threshold for cryotherapy before 6 weeks of age, earlier screening examinations probably are neither necessary nor warranted.

Parents of infants discovered to have threshold ROP should be offered the opportunity to have at least one eye of their baby treated with cryotherapy. Informed consent should include the warning that cryotherapy reduces but does not eliminate the risk of severe visual loss and that a complete permanent loss of vision in one or both eyes is possible despite the best available management.

ROBERT E. KALINA, MD  
Seattle

#### REFERENCES

Committee for Classification of Retinopathy of Prematurity: An international classification of retinopathy of prematurity. *Arch Ophthalmol* 1984; 102:1130-1134

Multicenter Trial of Cryotherapy for Retinopathy of Prematurity: Preliminary results. *Arch Ophthalmol* 1988; 106:471-479

## AIDS and the Management of Cytomegalovirus Retinitis

CYTOMEGALOVIRUS (CMV) RETINITIS is by far the most common vision-threatening disorder seen in patients with the acquired immunodeficiency syndrome (AIDS). Before the introduction of specific antiviral therapy against cytomegalovirus, progressive retinitis developed in these patients, terminating in blindness due to destruction of the retina. Two clinical presentations of CMV retinitis may occur—peripheral and central. Peripheral cytomegalovirus retinitis is often asymptomatic. An astute patient may notice “floaters,” which represent inflammatory cells in the vitreous cavity, and also a peripheral visual field defect. It is uncommon for patients to be aware of such symptoms, however. Flashing lights may also occur as traction is placed on the retina. Peripheral disease cannot be diagnosed with the direct ophthalmoscope; visualization of the peripheral retina is best with the head-mounted binocular indirect ophthalmoscope. This examination must be done through a dilated pupil. Central CMV retinitis affects the retina closer to the optic disc and macula. This can be diagnosed by an internist or primary care provider using the direct ophthalmoscope. Dilation of the pupil is also helpful in visualizing the posterior third of the retina. Patients often will describe a visual field loss as the retina close to the central vision is affected. Visual acuity loss may also occur, either through direct involvement of the fovea (the central retina) or owing to fluid associated with adjacent CMV retinitis. In such cases, immediate therapy is required to prevent a complete loss of vision.

Patients with either peripheral or central CMV retinitis typically have systemic infection elsewhere that may be subclinical. In such patients, buffy coat cultures are often positive, indicating the systemic importance of this disease. For the past several years, many groups have had experience with the new antiviral drug, ganciclovir. These groups have shown clearly that healing of retinitis occurs during therapy with this drug. In 1989, the Food and Drug Administration approved this agent for the treatment of cytomegalovirus retinitis. Intravenous infusion of this drug prevents enlarge-

ment of the lesions within a week, and over a period of three to four weeks healing and a resolution of retinal hemorrhage and edema occur. Several groups have shown, however, that if the drug is discontinued at any time, retinitis recurs. Physicians can be misled into thinking that the retinitis is healed because clinically it does look completely inactive. The drug is virostatic, however, and it almost invariably recurs. This is important to understand because discontinuing the drug will eventually lead to loss of vision. Daily maintenance therapy with ganciclovir is required for the life of these patients. The currently recommended dose is 5 mg per kg twice a day for 10 to 14 days—the induction dose—followed by a maintenance regimen of 5 mg per kg a day 7 days a week. Drug “holidays” and poor compliance may lead to a slowly progressive retinitis that can eventually destroy the central vision.

The care of patients with cytomegalovirus retinitis must be a joint effort between an infectious disease specialist or primary care provider experienced in administering toxic antiviral drugs and an ophthalmologist trained in indirect ophthalmoscopy and retinal disease. Wide-angle fundus photographs are essential to monitor the healing of the disease, to confirm a lack of progression, and to detect early reactivation. Typically photographs are taken at the time of diagnosis and some two to four weeks later as the retina heals. Subsequent photographs can be taken at each examination or when any change is noted clinically.

With such management, recent studies show that more than 75% of patients retain excellent central visual acuity for the duration of their lives. Unfortunately, bone marrow toxicity is a major problem in patients undergoing ganciclovir therapy and may make the concurrent use of zidovudine difficult. Other drugs including foscarnet are currently being evaluated by the Studies of the Ocular Complications of AIDS group in a randomized trial sponsored by the National Eye Institute. Centers are in New York, Baltimore, Miami, New Orleans, Chicago, Dallas, San Diego, Los Angeles, and San Francisco. Such studies will determine the best antiviral drugs for treating CMV retinitis. Other recent developments include the possible use of ganciclovir in an oral form; the narrow therapeutic ratio of this drug may make such therapy difficult. Several groups are currently evaluating the use of granulocyte-monocyte colony-stimulating factor as an adjunct to ganciclovir therapy. This recombinant cytokine may be useful in treating the neutropenia that is the most common side effect of ganciclovir.

Retinal detachment is a devastating complication of CMV retinitis and often occurs in patients with healed retinitis who previously had good vision. This complication occurs in as many as 20% of patients treated for CMV retinitis, often in both eyes. Vitrectomy surgical techniques are now available that can repair these retinal detachments in most patients. The definitive procedure includes using silicone oil in many cases. The decision to do this surgical procedure will depend on the visual acuity in a patient's other eye and the potential lifespan of the patient.

WILLIAM R. FREEMAN, MD  
La Jolla, California

#### REFERENCES

Freeman WR, Henderly DE, Wan WL, et al: Prevalence, pathophysiology and treatment of rhegmatogenous retinal detachment in treated cytomegalovirus retinitis. *Am J Ophthalmol* 1987; 103:527-536

Henderly DE, Freeman WR, Causey DM, et al: Cytomegalovirus retinitis and response to therapy with ganciclovir. *Ophthalmology* 1987; 94:425-434

Holland GN, Sidikaro Y, Kreiger AE, et al: Treatment of cytomegalovirus retinopathy with ganciclovir. *Ophthalmology* 1987; 94:815-823

Jabs DA, Enger C, Bartlett JG: Cytomegalovirus retinitis and acquired immunodeficiency syndrome. *Arch Ophthalmol* 1989; 107:75-80